DISC STORAGE SYSTEM WITH

ADAPTIVE PID CONTROL

ABSTRACT OF THE DISCLOSURE

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A disc drive controller circuit for an actuator receives reference data indicating a desired actuator position "θ_d" , error data indicating a difference "e" between the desired actuator position and a sensed actuator position "θ", and adaptive parameter data "$\hat{A}$". The controller

10   circuit calculates a circuit output "u" that drives the actuator. The controller circuit derives the circuit output "u" according to a fomula:

$$\hat{A}\left(\ddot{\theta}_d + 2\lambda\dot{e} + \lambda^2 e\right) + k\left(\dot{e} + 2\lambda e + \lambda^2 \int_0^t e \, d\tau\right)$$

in which "λ" is a controller zero value and "k" is a controller gain value and "t" is time. The adaptive parameter $\hat{A}$ is updated in general accordance with the formula:

15    $$\hat{A}(k) = e_1 e_2 \Delta t + \hat{A}(k-1).$$